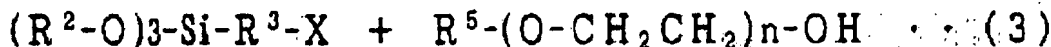




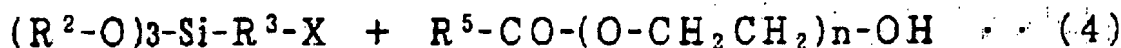
(R₂, R₃, and X are the same as the above among a formula.) R₄ is the hydrocarbon group or aryl group of with a carbon numbers of eight or more monovalence.

[Formula 3]



(R₂, R₃, and X are the same as the above among a formula.) R₅ is the hydrocarbon group of the monovalence of carbon numbers 1-18. n expresses the integer of 1-20.

[Formula 4]



(R₂, R₃, R₅, X, and n are the same as the above among a formula.)

[0012]

From a reaction formula (2), the silane compound which is a source material may be single, and it may be used about (4), you may mix and use it, and the same is said of the saturation which is another source material, unsaturated alcohol and aryls, glycols, and glycol ester. Although you may mix at a rate of arbitration, preferably, these are mole fraction and are the rates of 1 to 10 in saturation, unsaturated alcohol and aryls, glycols, and glycol ester to the silane compound 1.

[0013]

In these approaches, since it is easy to hydrolyze, as for the compound which is the specified substance, in the inside of a raw material and the system of reaction, and storage, it is desirable that it is in an anhydrous condition. Moreover, when there is a danger that a peroxide will generate, it is good to carry out reaction actuation, storage, etc. under inert gas ambient atmospheres, such as argon gas and nitrogen gas:

[0014]

Here, among formula (1) - (4), especially if R₂ is the hydrocarbon group of the monovalence of the shape of the shape of a straight chain of carbon numbers 1-5, and branching, it will not be limited, but as for all of three, the same radical may also differ. especially -- a methyl group and each ethyl group -- independence or these combination are desirable.

[0015]

R₃ Although what is necessary is just the hydrocarbon group of the bivalence of the shape of the shape of a straight chain of carbon numbers 1-9, and branching, -CH₂-, -CH₂CH₂-, -CH₂CH₂CH₂-, and -CH₂CH₂-Ph-CH₂- (Ph is a phenylene group) are especially desirable.

[0016]

As a silane compound which is a desirable source material, 3-chloropropyltrimetoxysilane, 3-chloropropyl triethoxysilane, 3-aminopropyl trimethoxysilane, 3-aminopropyl triethoxysilane, vinyltriethoxysilane, 3-chloropropyl

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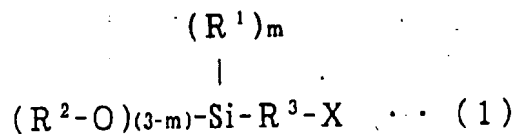
(54) ADDITIVE FOR RUBBER, AND RUBBER COMPOSITION USING THE SAME

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an additive for a rubber, and a rubber composition using the same, and particularly, to provide the rubber composition having sufficient physical stability in the inside of the rubber composition, and being excellent in low hardness and the other dynamic physical properties.

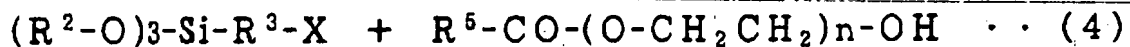
SOLUTION: The additive for the rubber is represented by formula (1) (wherein R1 is an 8C or more alkoxyl group, an ethylene glycol monoalkyl ether group, a

polyoxymonoalkyl ether group, an oxymonoalkyl ester group, a polyoxymonoalkyl ester group, or a phenoxyl group; R2 is a 1-5C monovalent hydrocarbon group; R3 is a 0-9C divalent hydrocarbon group; X is a halogen atom, an amino group, a methacryloxy group, or a vinyl group; and m is an integer of 1-3).



CLAIMS

[Claim(s)]



(R², R³, R⁵, X, and n are the same as the above among a formula.)

[Claim 5]

The rubber constituent characterized by containing the additive for rubber expressed with a formula (1).

[Claim 6]

The rubber constituent characterized by containing the additive for rubber which is obtained by the reaction according to claim 2 to 4, and is expressed with a formula (1).

[Claim 7]

The rubber constituent according to claim 5 or 6 which is chosen from the rubber in which the rubber which constitutes a rubber constituent has diene system rubber, polyether system rubber, or a polymethylene mold saturation principal chain and which is a kind at least.

[Claim 8]

The rubber constituent according to claim 5 to 7 with which the rubber additive of a general formula (1) is characterized by 1 - 100 weight **** rare ***** to the rubber 100 weight section.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[Field of the Invention]

[0001]

This invention relates to the rubber constituent which blended it with the additive for rubber used for the purpose of an improvement of the workability of rubber, and physical properties.

[Background of the Invention]

[0002]

In rubber processing, in order to improve workability, generally blending a plasticizer is often performed. Compatibility with the rubber to be used is important for a plasticizer. When compatibility is bad, it will be in the condition which is not desirable as a rubber constituent that a plasticizer shifts to a rubber front face etc., and physical-properties lowering will be brought about. As a plasticizer, many ester compounds to which an acid and alcohol were made to react generally are used. Moreover, process oil is used for natural rubber or polar low rubber like SBR for the improvement in workability etc.

[0003]

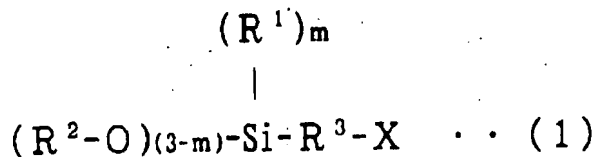
However, since the chemical bond of them has not been carried out to rubber or other combination chemicals, when rubber is used for a long period of time or is exposed to a chemical etc., these plasticizers and rubber processing aid like process oil shift to a rubber front face, and stability is bad [processing aid].

[0004]

[Claim 1]

The additive for rubber expressed with the following type (1).

[Formula 1]



(R¹ is the alkoxy group which are eight or more carbon numbers, an ethylene glycol monoalkyl ether radical, a polyoxy monoalkyl ether radical, an oxy-monoalkyl ester group, a polyoxy monoalkyl ester group, or a phenoxy group among a formula, R² expresses the hydrocarbon group of the monovalence of carbon numbers 1-5, and R³ expresses the hydrocarbon group of the bivalence of carbon numbers 0-9, respectively.) X is a halogen atom, the amino group, a meta-chestnut ROKISHIRU radical, or a vinyl group. m expresses the integer of 1-3. When two or more R¹ exists in the interior of a molecule, they are the same radical or a different radical mutually. It is mind with the same said of R². Moreover, the carbon number of R³ means in 0 that X is directly linked with Si.

[Claim 2]

The additive for rubber according to claim 1 whose formula (1) is the mixture obtained by the reaction of the following type (2).

[Formula 2]

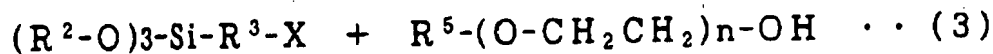


(R², R³, and X are the same as the above among a formula.) R⁴ is the hydrocarbon group or aryl group of with a carbon numbers of eight or more monovalence.

[Claim 3]

The additive for rubber according to claim 1 whose formula (1) is the mixture obtained by the reaction of the following type (3).

[Formula 3]



(R², R³, and X are the same as the above among a formula.) R⁵ is a hydrogen atom or the hydrocarbon group of the monovalence of carbon numbers 1-18. n expresses the integer of 1-20.

[Claim 4]

The additive for rubber according to claim 1 whose formula (1) is the mixture obtained by the reaction of the following type (4).

[Formula 4]